IN THE CLAIMS:

1.   (Currently Amended) An evaluation method of a semiconductor device comprising:

measuring a drain current characteristics of a gate voltage of the semiconductor device;

obtaining a threshold voltage and a flat band voltage from [[a]] the drain current characteristics of [[a]] the gate voltage of the semiconductor device;

obtaining an activated dopant density from the threshold voltage and the flat band voltage; and

obtaining an added dopant density in the semiconductor device.

2.   (Previously Presented) The evaluation method of the semiconductor device according to claim 1, wherein the added dopant density in the semiconductor device is obtained by secondary ion mass spectrometry analysis.

3.   (Previously Presented) The evaluation method of the semiconductor device according to claim 1, wherein the activated dopant density and the added dopant density in a channel region of the semiconductor device are obtained.

4.   (Previously Presented) The evaluation method of the semiconductor device according to claim 1, wherein the activated dopant density and the added dopant density in an impurity region of the semiconductor device are obtained.

5.   (Previously Presented) The evaluation method of the semiconductor device according to claim 1, further comprising obtaining a dopant activation rate from the activated dopant density and the added dopant density.

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6.   (Previously Presented) A device design management system comprising:

a means for measuring drain current characteristics of a gate voltage of a semiconductor device constructing a device;

a computer having a means for computing an activated dopant density from the drain current characteristics of the gate voltage; and

a means for measuring an added dopant density in the semiconductor device,

wherein the computer has a function which computes a dopant activation rate from the activated dopant density and the added dopant density, and determines a dose amount from the dopant activation rate.

7.   (Previously Presented) A device design management system comprising:

a means for measuring drain current characteristics of a gate voltage of a semiconductor device constructing a device, and obtaining a threshold voltage and a flat band voltage; and

a computer having a means for computing an activated dopant density from the threshold voltage and the flat band voltage, and a dopant activation rate,

wherein the computer has a function to determine a dose amount from the dopant activation rate and the activated dopant density.

8.   (Previously Presented) A device design management system comprising:

a means for measuring an added dopant density in a semiconductor device constructing a device; and

a computer having a means for computing a threshold voltage and a flat band voltage from the dopant density and a dopant activation rate,

wherein the computer has a function to determine a dose amount from the dopant activation rate, and the threshold voltage and the flat band voltage.

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9.   (Previously Presented) A production method of a semiconductor device comprising:

    forming a semiconductor film on an insulating surface;

    crystallizing the semiconductor film;

    adding dopant to the crystallized semiconductor film at a dose amount, wherein the dose amount of the dopant is determined in accordance with a dopant activation rate of the dopant in a channel region of the semiconductor film; and

    activating the added dopant in the semiconductor film.

10.   (Previously Presented) A production method of a semiconductor device comprising:

    forming a semiconductor film on an insulating surface;

    crystallizing the semiconductor film;

    adding dopant to the crystallized semiconductor film at a dose amount to form a source region and a drain region, wherein the dose amount of the dopant is determined in accordance with a dopant activation rate of the dopant; and

    activating the added dopant in semiconductor film.

11.   (Previously Presented) A dose amount control program for a computer that controls a dose amount in a semiconductor device, said computer comprising:

    a computing means for computing a dopant activation rate from a threshold voltage and a flat band voltage of the semiconductor device; and

    a setting means for setting a predetermined dose amount according to the dopant activation rate obtained from the computing means.

12.   (Previously Presented) The dose amount control program according to claim 11, wherein the computing means obtains an activated dopant density by a formula

$$V_{th} - V_{fb} = (e \cdot ni/C_{ox})(Nd/ni) \cdot [(4\epsilon O \cdot \epsilon Si \cdot kT)/(e^2 \cdot (Nd/ni) \cdot ni) \cdot ln(Nd/ni)]^{\frac{1}{2}}$$
$$+ (2kT/e) \cdot ln(Nd/ni)$$

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(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, ε0: vacuum dielectric constant, εSi: semiconductor dielectric constant, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

13.   (Previously Presented) The dose amount control program according to claim 11, wherein the computing means obtains an activated dopant density by a formula

$$Vth - Vfb = (e \cdot (Nd/ni) \cdot ni \cdot tSi)/Cox + (2kT/e) \cdot \ln(Nd/ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, tSi: active layer thickness, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

14.   (Previously Presented) A dose amount control program for a computer that controls a dose amount in a semiconductor device, said computer comprising:

a computing means for computing a dopant activation rate from a threshold voltage and a flat band voltage of the semiconductor device;

a storage means for recording dopant activation rates that are obtained by the computing means with respect to a plurality of semiconductor devices with different production conditions;

a determining means for selecting a dopant activation rate of a predetermined semiconductor device from the storage means; and

a setting means for setting a dose amount, according to the dopant activation rate selected by the determining means.

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15.   (Previously Presented) The dose amount control program according to claim 14, wherein the computing means obtains an activated dopant density by a formula

$$Vth-Vfb=(e \cdot ni/Cox)(Nd/ni) \cdot [(4\varepsilon O \cdot \varepsilon Si \cdot kT)/(e^2 \cdot (Nd/ni) \cdot ni) \cdot ln(Nd/ni)]^{1/2}$$
$$+(2kT/e) \cdot ln(Nd/ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, εO: vacuum dielectric constant, εSi: semiconductor dielectric constant, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

16.   (Previously Presented) The dose amount control program according to claim 14, wherein the computing means obtains an activated dopant density by a formula

$$Vth - Vfb = (e \cdot (Nd / ni) \cdot ni \cdot tSi) / Cox + (2kT / e) \cdot ln(Nd / ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, tSi: active layer thickness, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

17.   (Previously Presented) A computer-readable recording medium that records a dose amount control program for a computer that controls a dose amount in a semiconductor device, said computer comprising:

a computing means for computing a dopant activation rate from a threshold voltage and a flat band voltage of the semiconductor device;

a setting means for setting a predetermined dose amount according to the dopant activation rate obtained from the computing means; and

a means for outputting the dose amount that is set by the setting means.

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18.   (Previously Presented) The computer-readable recording medium according to claim 17 that records a dose amount control program, wherein the computing means obtains an activated dopant density from a formula

$$Vth-Vfb = (e \cdot ni/Cox)(Nd/ni) \cdot [(4\varepsilon O\varepsilon Si \cdot kT)/(e^2 \cdot (Nd/ni) \cdot ni) \cdot \ln(Nd/ni)]^{\frac{1}{2}}$$
$$+(2kT/e) \cdot \ln(Nd/ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, ε0: vacuum dielectric constant, εSi: semiconductor dielectric constant, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

19.   (Previously Presented) The computer-readable recording medium according to claim 17 that records a dose amount control program, wherein the computing means obtains an activated dopant density from a formula

$$Vth - Vfb = (e \cdot (Nd/ni) \cdot ni \cdot tSi)/Cox + (2kT/e) \cdot \ln(Nd/ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, tSi: active layer thickness, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

20.   (Previously Presented) A computer-readable recording medium that records a dose amount control program for a computer that controls a dose amount in a semiconductor device, said computer comprising:

a computing means for computing a dopant activation rate from a threshold voltage and a flat band voltage of the semiconductor device;

a storage means for recording dopant activation rates that are obtained by the computing means with respect to a plurality of semiconductor devices with different production conditions;

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a determining means for selecting a dopant activation rate of a predetermined semiconductor device from the storage means; and

a setting means for setting a dose amount according to the dopant activation rate selected by the determining means.

21.   (Previously Presented) The computer-readable recording medium according to claim 20 that records a dose amount control program, wherein the computing means obtains an activated dopant density from a formula

$$Vth-Vfb=(e \cdot ni/Cox)(Nd/ni) \cdot [(4\varepsilon O \cdot \varepsilon Si \cdot kT)/(e^2 \cdot (Nd/ni) \cdot ni) \cdot ln(Nd/ni)]^{\frac{1}{2}}$$
$$+(2kT/e) \cdot ln(Nd/ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, $\varepsilon 0$: vacuum dielectric constant, εSi: semiconductor dielectric constant, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

22.   (Previously Presented) The computer-readable recording medium according to claim 20 that records a dose amount control program, wherein the computing means obtains an activated dopant density from a formula

$$Vth - Vfb = (e \cdot (Nd/ni) \cdot ni \cdot tSi)/Cox +(2kT/e) \cdot ln(Nd/ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, tSi: active layer thickness, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

23.   (Previously Presented) A dose amount control device for a semiconductor device, comprising:

a means for inputting a threshold voltage and a flat band voltage of the semiconductor device, or a dopant density therein;

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a computing means for computing a dopant activation rate from the threshold voltage and the flat band voltage;

a setting means for setting a predetermined dose amount according to the dopant activation rate obtained from the computing means; and

a means for outputting the dose amount that is set by the setting means.

24.   (Previously Presented) The dose amount control device according to claim 23, wherein the computing means obtains an activated dopant density from a formula

$$Vth\text{-}Vfb=(e\cdot ni/Cox)(Nd/ni)\cdot[(4\varepsilon O\cdot\varepsilon Si\cdot kT)/(e^2\cdot(Nd/ni)\cdot ni)\cdot ln(Nd/ni)]^{\frac{1}{2}}$$
$$+(2kT/e)\cdot ln(Nd/ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, $\varepsilon 0$: vacuum dielectric constant, εSi: semiconductor dielectric constant, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

25.   (Previously Presented) The dose amount control device according to claim 23, wherein the computing means obtains an activated dopant density from a formula

$$Vth - Vfb = (e\cdot(Nd/ni)\cdot ni\cdot tSi)/Cox + (2kT/e)\cdot ln(Nd/ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, tSi: active layer thickness, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

26.   (Previously Presented) A dose amount control device for a semiconductor device, comprising:

a means for inputting production conditions of the semiconductor device or design conditions of a device including the semiconductor device;

a computing means for computing a dopant activation rate from a threshold voltage and a flat band voltage of a semiconductor device to be measured;

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a storage means for recording dopant activation rates that are obtained by the computing means with respect to a plurality of semiconductor devices with different production conditions;

a determining means for selecting a dopant activation rate of a predetermined semiconductor device from the storage means;

a setting means for setting a dose amount according to the dopant activation rate selected from the determining means; and

a means for outputting a dose amount that is set by the setting means.

27.   (Previously Presented) The dose amount control device according to claim 26, wherein the computing means obtains an activated dopant density from a formula

$$Vth-Vfb=(e \cdot ni/Cox)(Nd/ni) \cdot [(4 \varepsilon O \cdot \varepsilon Si \cdot kT)/(e^2 \cdot (Nd/ni) \cdot ni) \cdot ln(Nd/ni)]^{1/2}$$
$$+(2kT/e) \cdot ln(Nd/ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, εO: vacuum dielectric constant, εSi: semiconductor dielectric constant, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

28.   (Previously Presented) The dose amount control device according to claim 26, wherein the computing means obtains an activated dopant density from a formula

$$Vth - Vfb = (e \cdot (Nd / ni) \cdot ni \cdot tSi) / Cox + (2kT / e) \cdot ln(Nd / ni)$$

(herein, Vth: threshold voltage, Vfb: flat band voltage, e: electron charge, ni: intrinsic carrier density, tSi: active layer thickness, Cox: semiconductor device insulating film capacitance, Nd: activated dopant density, k: Boltzmann constant, T: absolute temperature), and obtains a dopant activation rate from the activated dopant density and an added dopant density.

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29.   (Previously Presented) An evaluation method of a semiconductor device comprising:

measuring a drain current characteristics of a gate voltage of the semiconductor device;

obtaining an activated dopant density from the drain current characteristics of the gate voltage of the semiconductor device;

obtaining an added dopant density in the semiconductor device; and

obtaining a dopant activation rate from the activated dopant density and the added dopant density.

30.   (New) The evaluation method of the semiconductor device according to claim 5, further comprising determining a dose amount from the dopant activation rate.

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